

Docket No.: 50432-204



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
Minh Van NGO, et al. :
Serial No.: 09/986,267 : Group Art Unit: 2812
Filed: November 08, 2001 : Examiner: J. Brophy
For: METHOD OF FORMING RELIABLE CU INTERCONNECTS

DECLARATION UNDER 37 CFR §1.131

Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

Sir:

We, Minh Van Ngo, Arvind Halliyal and Eric Paton, hereby declare that::

1. We are the inventors of the invention disclosed and claimed in the above-referenced United States patent application.

2. We are aware of the prosecution history of this application which was filed in the U.S. Patent and Trademark Office on November 8, 2001. We are also aware that the application is under rejection on various grounds, including a rejection under 35 U.S.C. §103 for obviousness predicated upon U.S. Patent 6,261,963 issued to Zhao et al. on July 17, 2001 based upon an application filed in the United States Patent and Trademark Office on July 7, 2000.

3. To our knowledge and in view of the factual evidence supplied herewith, the present invention was conceived in the United States prior to July 17, 2001, the issue date of the Zhao et al. patent. This fact is evidenced by the attached invention disclosure submitted to Advanced Micro Devices, Inc. (AMD), the assignee herein (Exhibit A hereto). Due diligence was exercised from prior to the issue date of July 17, 2001 to the filing date of the present application on November 8, 2001.

4. We further declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful statement may jeopardize the validity of the application or any patent issuing thereon.

2/4/03
Date

2/7/03
Date

2/4/03
Date

Minh Van Ngo
Minh Van Ngo

Arvind Halliyal
Arvind Halliyal

Eric Paton
Eric Paton

AMD INVENTION DISCLOSURETLD ID# G0267

Rec'd date _____

Sunnyvale x42110. return to MS68.

Texas x55964 return to MS62

Project: ☐, Product: ☐, Process: ☒, Technology ☐, to which the invention applies (identify): _____

List 2 to 5 key words useful to search by to find patents or art related to this invention: _____

Working title of invention: To eliminate voidings in Cu interconnects
to improve EM**INVENTOR/SESSION PARTICIPANT ADDRESS INFORMATION IS ON THE NEXT PAGE (1A)**

Inventor's signature: _____ date: _____

Inventor's printed full name: MIMH VAN NGo Citizenship: _____

Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____

Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____

Residence address: _____

Post Office address: _____

Co-Inventor's signature: _____ date: _____

Co-Inventor's printed full name: Arvind Halligal Citizenship: _____

Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____

Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____

Residence address: _____

Post Office address: _____

Co-Inventor's signature: _____ date: _____

Co-Inventor's printed full name: Eric Paton Citizenship: _____

Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____

Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____

Residence address: _____

Post Office address: _____

Co-Inventor's signature: _____ date: _____

Co-Inventor's printed full name: _____ Citizenship: _____

Employee #: _____ Extension: _____ Mail stop: _____ Home telephone: () _____

Division: _____ Directorate: _____ Dept #: _____ Dept: _____ Manager: _____

Residence address: _____

Post Office address: _____

List on additional sheet if there are more co-inventors and list total number of inventors here: _____

Name(s) of attorney(s) preferred by inventor(s) to prepare patent application, if known: _____

LAW FIRM: MCDERMOTT, WILL & EMERY**ATTORNEY: Arthur J. Steiner**

Witness 1 initial: _____ Witness 2 initial: _____

AMD INVENTION DISCLOSURE

California x42110, return to MS68,

Texas x55964 return to MS62,

Dresden x83401 Silke Kretzschmar at MS E21-PP.

TLD ID#

Rec'd date

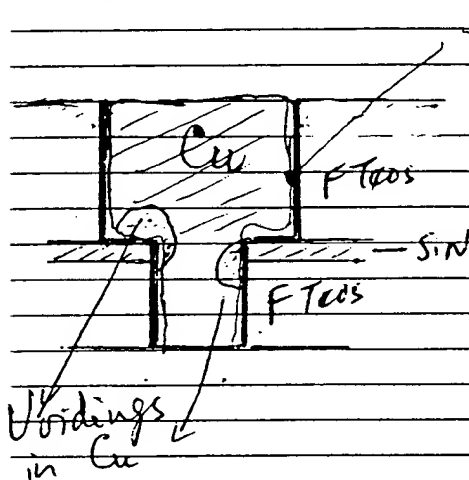
State the problem solved by this invention:

~~Improper adhesion between Ta (BMD)~~

~~and the FTOs (SMD)~~

To eliminate Cu voiding in interconnects

Brief description and/or sketch of invention (please attach copies of AMD patent notebook pages, reports or drawings):



We have seen many voidings in Cu interconnects during the processing of HIP6L & HIP7 at both AMD Fabs. These voidings are major concerns for the circuit reliability (low EM).

Use LTA/ NH_3 anneal at high temp to flow-in Cu voidings, Seal-off voiding at post Cu plating before Cu CMP.

NH_3 flow rate: — to — SCCM
 $T =$ — °C to — °C
 Gas pressure: — to —

Patent notebook # _____ Page numbers _____ Number of drawings _____

Witness 1 initial: _____ Witness 2 initial: _____